

## Patent claims:

1. An expandable pelletized styrene polymer material having a bi- or multimodal molecular weight distribution, which, based in each case on the entire styrene polymer content, comprises
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- i) from 0.1 to 30% by weight of a styrene copolymer with a weight-average molar mass  $M_w$  in the range from 1000 to 20 000 g/mol, and
- ii) from 99.9 to 70% by weight of standard polystyrene (GPPS) with a weight-average molar mass  $M_w$  in the range from 160 000 to 400 000 g/mol.
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2. The expandable styrene polymer according to claim 1 wherein the styrene copolymer used comprises a copolymer composed of styrene, acrylic acid and/or  $\alpha$ -methylstyrene.
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3. The expandable, pelletized styrene polymer material according to claim 1 or 2 which comprises from 3 to 7% by weight of an organic blowing agent.
4. A process for preparing expandable pelletized styrene polymer materials according to claim 1, comprising the steps of
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- a) preparing a mixture of styrene polymers which, based in each case on the entire styrene polymer contents comprise
- i) from 0.1 to 30% by weight of a styrene copolymer with a weight-average molar mass  $M_w$  in the range from 1000 to 20 000 g/mol, and
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- ii) from 99.9 to 70% by weight of standard polystyrene (GPPS) with a weight-average molar mass  $M_w$  in the range from 160 000 to 400 000 g/mol.
- b) mixing to incorporate an organic blowing agent into the polymer melt by means of a static or dynamic mixer at a temperature of at least 150°C,
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- c) cooling the polymer melt comprising blowing agent to a temperature of at least 120°C,
- d) discharge via a die plate with holes whose diameter at the discharge from the die is at most 1.5 mm, and
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- e) pelletizing the melt comprising blowing agent directly downstream of the die plate under water at a pressure in the range from 1 to 25 bar.
5. A process for producing moldable-foam moldings, which comprises, in a first step, using hot air or steam to prefoam expandable pelletized styrene polymer materials according to claim 1 to give foam beads whose density is in the range from 8 to 100 g/l, and, in a 2nd step, fusing these materials in a closed mold.
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